Apo-Rodagon-D

Highest Reproduction Quality at Scales from 0.4x to 2.5x

Depending on their optimization and the film sizes, classic enlarging lenses produce high image quality – even for demanding work – from around 3× to over 20×. When used as taking lenses, e. g. for macro photography or on CCD cameras, the same applies to the reciprocal imaging scale from 1:3 to above 1:20.

But when duplicating transparencies, preparing inter-negatives, for macro photography and for applications using slide or graphics scanners, image reproduction scales of 0.5× to 2× are used, scales where even the best enlarging lenses begin to show visible defects in imaging quality. The 6-element, apochromatically corrected high-performance lens Rodenstock Apo-Rodagon-D was designed especially for these applications.

The Apo-Rodagon-D lenses are characterized by high contrast, exceptionally high and uniform sharpness to the corners and practically complete freedom from color fringes. The MC coating increases transmission and prevents the flare which would reduce contrast. Distortion over the entire scale range recommended for the particular lens is less than 0.3 %.

Apo-Rodagon-D 1x 75 mm f/4 – Perfection for Images at Approximately 1:1

The Rodenstock Apo-Rodagon-D 1× 75 mm f/4 with a symmetrical design and 6 elements in 4 groups is optimized for the scale of 1× and produces excellent results in the range from 0.8× to 1.2×. At a reproduction scale of 1× the image circle diameter is 80 mm so that the format 6×6 cm is filled to the corners and CCD array lengths of up to 80 mm are possible.

F/5.6 produces the best image quality and freedom from vignetting over the full image angle and is recommended as the working aperture. Stopping down further would reduce the sharpness due to diffraction. Full aperture can be used as the working f/stop for 35 mm shots or for CCD array lengths up to 40 mm.

Apo-Rodagon-D 2x 75 mm f/4.5 – Perfection at Magnification Scales Around 2x (0.5x)

The Rodenstock Apo-Rodagon-D 2× 75 mm f/4.5 fills the gap between the imaging scale ranges of the Apo-Rodagon-D 1× and the Apo-Rodagon-N enlarging lenses. It is asymmetric in construction with 6 elements in 4 groups and is designed for format sizes up to 6×7 cm and scales of 1.2× to 2.5× for projection purposes or 0.8× to 0.4× for taking purposes. The size data refer to the smaller side, i. e. for projection onto the original (e. g. negative or transparency) and for taking onto the picture (film or CCD). When used as a CCD taking lens, the maximum CCD array length is 88 mm. See the table on the right for format sizes (diagonals) on the other side, i. e. image size for projection and original size for taking.

The Apo-Rodagon-D 2× delivers reproduction without vignetting at full aperture. Recommended working f/stop with optimum image reproduction quality is 4.5 to 8 depending on the scale (see table on the right).

Apo-Rodagon-D 1× 75 mm f/4 und 2× 75 mm f/4.5

Stopping down even further will lead to a reduction in image reproduction quality – particularly in the picture center – due to the effect of diffraction.

Usable as an Enlarging Lens or as a Taking Lens for a Film or CCD Camera

Both versions of the Apo-Rodagon-D are in a 39 mm Leica thread mount with diaphragm housing like the Apo-Rodagon-N enlarging lenses series and, like these, can be used on enlargers or on almost any camera with a suitable adapter.

A focusing aid is required for use with cameras without bellows. Rodenstock offers the optional Modular-Focus tube for this purpose. This helical focusing tube has a focusing travel of 25 mm and can be adapted for the required extension of the camera being used with Rodenstock extension tubes. The front ring of the Modular-Focus has a 39 mm thread mount and accepts the Apo-Rodagon-D. The rear of the Modular-Focus tube accepts either an adapter with C mount thread (for most CCD cameras), with a 39 mm (Leica) thread or an adapter for standard T2 adapters.

The straight line focusing of the Modular-Focus tube ensures that the diaphragm window and the diaphragm lever for disengaging 1/2 click stops do not turn during focusing and can always be read off or operated from same position.

The Apo-Rodagon-D 2× 75 mm f/4.5 can be used in the "retro position" by using a commercial reversing ring (M 40.5×0.5) for the individual camera mount. An adapter ring for mounting to the Modular-Focus or to enlargers with Leica lens mount (M 39×1/26") is available as a Rodenstock accessory. In the retro position vignetting is possible depending on the type of enlarger and/or the camera mount and the adapter ring required.

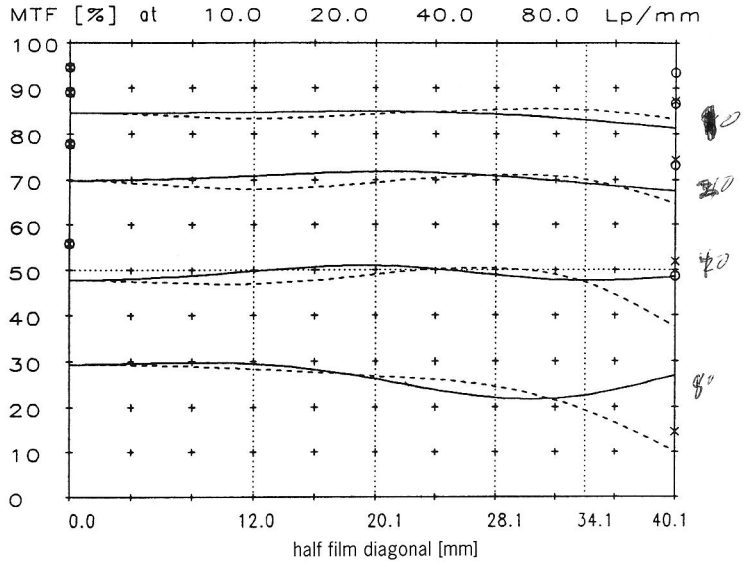
Apo-Rodagon-D 2x: Recommended Working Aperture and Maximum Image and Subject Size

Magnification scale when used as a projection lens or in retro position when used as a taking lens	Magnification scale when used as a taking lens or in retro position when used as a projection lens	Recommended working aperture	As a projection lens: Image size in normal or subject size in retro position As a taking lens: subject size in normal or image size in retro position
1.2×	0.8×	4.5	Max. 105 mm (diagonal)
1.5×	0.7×	5.6	Max. 130 mm (diagonal)
2.0×	0.5×	5.6-8	Max. 175 mm (diagonal)
2.5×	0.4×	8	Max. 220 mm (diagonal)

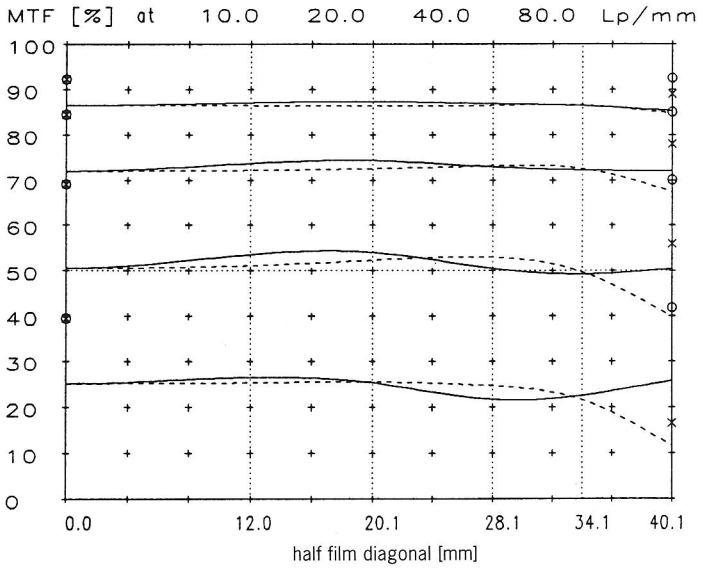
Apo-Rodagon-D 2× 75 mm f/4.5 with Modular-Focus

Apo-Rodagon-D 1x 75 mm f/4

MTF at ratio 1x f/4



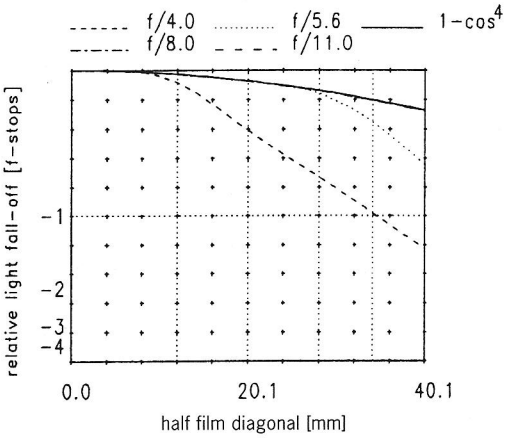
MTF at ratio 1x f/5.6



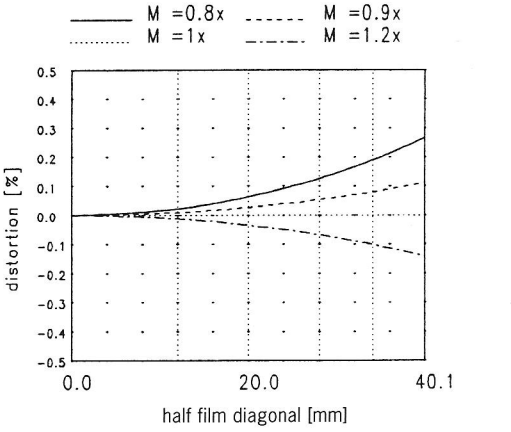
——— sagittal, o Diffraction limited value
------ meridional, × Diffraction limited value

Named frequencies [line pairs/mm] in modular transfer function ((MTF) as well as diagrams of relative light fall-off, distortion and longitudinal color aberation refer to film plane.

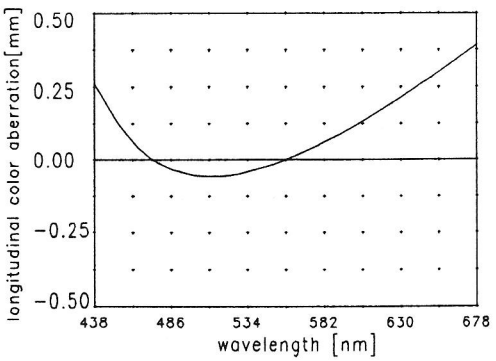
relative light fall-off at ratio 1x



Distortion at ratio 0.8x to1.2x



Longitudinal color aberration at ratio 1x



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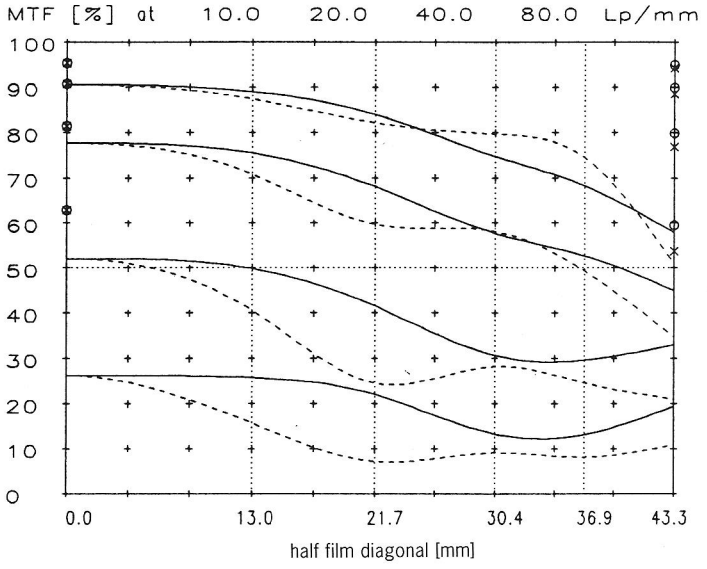
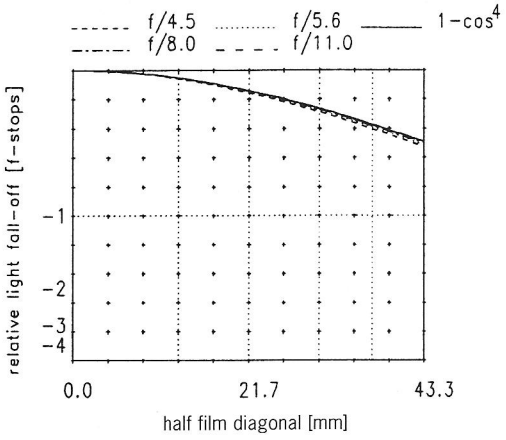
Apo-Rodagon-D 2x 75 mm f/4.5

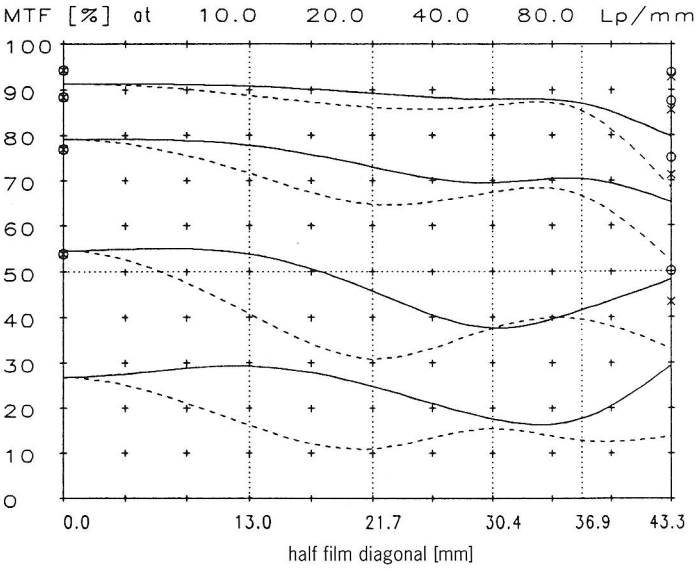
MTF at ratio 0.5x f/4.5



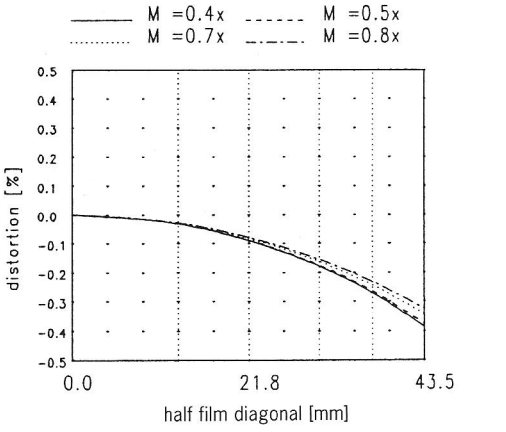
relative light fall-off at ratio 0.5x



MTF at ratio 0.5x f/5.6



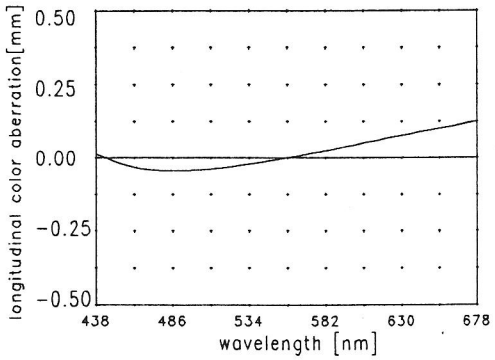
Distortion at ratio 0.4x to0.8x



sagittal, ○ Diffraction limited value

meridional, × Diffraction limited value

Longitudinal color aberration at ratio 0.5x



Named frequencies [line pairs/mm] in modular transfer function ((MTF) as well as diagrams of relative light fall-off, distortion and longitudinal color aberation refer to film plane.

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